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Asymptotic Laplace Transforms and Watson's Lemma .

The purpose of this talk is to present an asymptotic version of the Laplace transform which have the benefit that all $f \in L^1_{loc}([0, \infty); X)$ are transformable. The usefulness of the Laplace transform in applications to differential and integral equations is due to the fact that it maps differentiation, integration, and more generally, convolution onto multiplication. We will show that these crucial operational properties extend to the Asymptotic Laplace Transform as well. Finally, we will show that for every locally integrable function that admits an asymptotic expansion in terms of t^n , its associated Laplace Transform admits an asymptotic expansion in terms of $\frac{1}{\lambda^n}$. (Received September 22, 2010)